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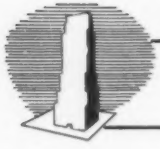

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HUMAN ECOLOGY OF WESTERN MONTANA VALLEYS*

NICHOLAS HELBURN
Montana State College

In the Northern Rocky Mountains, physiography and climate have reinforced one another to create a strong natural pattern. Flat, semiarid, grassland valleys alternate with rough, humid, timbered mountain ranges. Human occupancy has followed that pattern. Population and land use reflect repeated sequences of different natural environments.

VEGETATION IN ALTITUDINAL ZONES

R. F. Daubenmire summarized the knowledge of vegetation in the Rocky Mountains in 1943. He described six zones above the grasslands and deserts as follows:

TUNDRA FORMATION
1. Alpine tundra zone

NEEDLE-LEAVED FOREST FORMATION
2. Engelmann spruce-subalpine fir zone
3. Douglas fir zone
4. Ponderosa pine zone
5. Juniper-pinion zone
6. Oak-mountain mahogany zone.[1]

These zones are repeated in the same relative altitudinal position all the way from New Mexico to Canada. In the Northern Rockies, the lower two zones, number 5, juniper-pinion and number 6, oak-mountain mahogany, are either missing or so minor in distribution

* Presented at the meeting of the National Council of Geography Teachers in San Francisco, California, August 19, 1954.

[1] R. F. Daubenmire, "Vegetational Zonation in the Rocky Mountains." *The Botanical Review*, Vol. 9, No. 6 (June, 1943), p. 330.

as to be negligibile. Here the grassland formation of the valley floor intersects the mountain slopes in the ponderosa pine or Douglas fir zones.

The consensus of opinion is that the repeated sharp boundary between forested mountains and grassed valley floors is attributable to differences in soil texture. After pointing out the relatively high soil aeration requirements of most trees and shrubs in the Rockies, Daubenmire goes on: "Since the alluvial and loessal soil of the basal plains are commonly finer textured than the residual

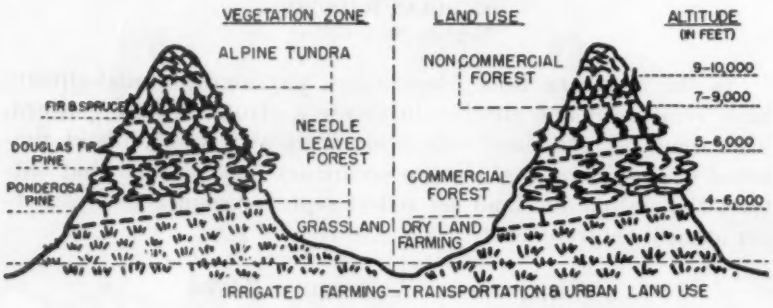

FIG. 1

covering of the mountain slopes . . . , the lower limits of the ligneous associations often terminate abruptly at the lower edge of the mountain slopes where the erosional and depositional surfaces are in contact. Even tho extension of mountain association to lower altitudes would be possible from the standpoint of climate, the occurrence of bodies of fine textured soils at lower altitudes often elevates lower timberline far above its climatic limits, sometimes setting this line so high as to fall in the Douglas fir zone."[2]

Continuing from Daubenmire's excellent work, we can divide the valley grassland formation into two types—terraces and river flood plains. The terraces are higher, mildly sloping, generally well drained and generally covered with short grasses and mature steppe soils. The river flood plains are lower, flatter, often poorly drained, with generally young alluvial soils, covered by mid-grasses and often including "Galleria" deciduous forests along the water courses.

[2] R. F. Daubenmire, op. cit., p. 370.

LAND USE ZONES

If we start at the top of any high mountain range in the Northern Rockies, then, we can expect to move down thru the following zones:

First. We will start in the *alpine tundra formation* composed mostly of barren rock but including more or less alpine meadow. Elevation 12,000 to 9,000 feet. Physiography—peaks and exposed ridges. Rainfall will be generally over 50 inches. Soils are generally imperfectly developed with bog soils occupying the flat areas and basins of accumulation.

Second. *Subalpine forest zone:* Engelmann spruce and alpine fir dominate this zone of slow growth. Altitude 10,000 to 7,000 feet. Physiography—high mountain slopes and protected narrow canyons. Rainfall is 60 to 30 inches. Podzolic soils may be developed but lithosols are common.

Third. *Douglas fir forest zone:* In western Montana this may have considerable western larch. Lodgepole pine is common thruout the area as a fire pioneer and subclimax. Elevation is 9,000 to 5,000 feet. Physiography—stream dissected and glaciated mountains. Slopes 40 to 60 per cent. Rainfall 60 to 30 inches. Soils similar to two previous zones.

Fourth. *Ponderosa pine forest zone:* This may be an almost pure stand of western yellow pine but may have significant amounts of both Douglas fir and lodgepole pine. Elevation is 6,000 to 4,000 feet. Physiography—lower mountain slopes. Rainfall 30 to 20 inches.

Fifth. *Terraces:* Bunch grass steppe, intermediate to short in height. Altitude 6,000 to 3,500 feet. Physiography—gently sloping terraces. Slopes 2 to 6 per cent. Rainfall 25 to 11 inches. Soils—chernozem to grey-brown steppe soils.

Sixth. *River flood plains:* Grass steppe with galleria forest. Elevation 5 to 3,000 feet. Physiography—recent and current flood plains. Flat. Slope 2 per cent or less. Rainfall 18 to 11 inches. Soil—chernozems and chestnut steppe soils with much immature recent alluvium.[3]

[3] Before leaving the subject of the altitudinal zonation, we should mention one exception. North of the 48th parallel, practically all of the land, including the valley

As human occupance has matured in this region, the first two zones described have remained almost completely in their wilderness condition. No commercial use has been made of the timber or forage at these high elevations. These lands remain almost entirely in federal ownership, having been set aside early in the history of the U. S. Forest Service. Because they lack commercial use, one should not assume that they are considered useless. Thruout the region, people are very conscious of the contribution these lands make. As a scenic attraction and as a home for wildlife, they are appreciated. Their primary value, however, is recognized as watershed. They contribute enormous quantities of water during the dry summer months to be used below for power, recreation and especially irrigation.

The third and fourth zones have been used primarily as commercial forest. In a few places, one finds abandoned homesteads where pioneer settlement tried to develop the mountain slopes for agriculture. Universally, farms in this zone have been abandoned and the forest zones remain uninhabited. Lumbering does take place, on an increasingly large scale since World War II. Until then, yellow pine was the only highly valuable tree. Douglas fir and western larch were considered marginal. Unless a saw mill could dispose of some of its fir and larch in the form of railroad ties or mine timbers, it might have a serious marketing problem.[4] Now, however, this zone is contributing large amounts of fir, larch and even lodgepole pine to the nation's lumber supply.[5] Again, National Forest ownership is dominant in this zone, but much of the better quality and more accessible land is privately owned. The Northern Pacific Railroad land grant is responsible for a great deal of the privately-owned land in this zone, most of it in a checkerboard pattern of alternate sections with U. S. Forest

floors, was naturally in needle leafed forest formation. The forested valley floors are closely correlated in distribution with the southward limited glaciation in the valley floors. Here again, soil texture would seem to make the difference between forest and grassland formations.

[4] See Nicholas Helburn, *Geography of the Lumber Industry, N. W. Montana.* Ph.D. Thesis, University of Wisconsin, 1950.

[5] On the Idaho slope of the Bitterroot and Cabinet Mountains, a much more mesic and floristically varied forest type is found. This enters Montana only in the extreme Northern part—Lincoln and Flathead counties. It includes the most valuable softwood in the West, western white pine (Pinus Monticola), and for this reason is commercially very important.

Service land. In addition to timber supply, watershed, recreation, wildlife and grazing are recognized as important uses.

The fifth zone, in contrast to the higher zones, is primarily in agricultural use. Much of it remains as native range, utilized by cattle in a commercial ranching economy. Much of it has been plowed for a dry-land wheat farming in which fallow and small grains, mostly wheat, are the only feasible rotation.[6] In a few places, these benchlands have been irrigated. Land ownership is mostly in private hands, altho in southwestern Montana public domain forms a significant fraction of the total. Much of the privately-owned land is in large holdings, some of them over a hundred thousand acres. Population densities run from less than one person per square mile to as many as ten persons per square mile.

The final zone, the river flood plains, is almost entirely farmed. Most of it is irrigated, leaving the farmer a chance to diversify which results in a commercial crop and livestock type of farming. Livestock includes all of the familiar types—beef cattle, dairy cattle, sheep, hogs, poultry and horses—altho beef cattle are dominant. Crops are still dominated by the small grains and hay while potatoes, vegetables and small fruits hold a minor position. Land ownerships tend to be small with the majority of units between 100 and 200 acres. Rural population density varies from 10 to 30 persons per square mile. Practically all of the urban uses of land take place in this zone. Except for those stretches of route which cross from one valley to another, practically all the highway and railroad mileage lies on the river flood plains.

This altitudinal succession of land uses has been recognized before, witness Wesley Calef's discussion of integration of the use of irrigated and non-irrigated land in the Intermont West.[7]

It is fairly well understood within the region. On small scale maps it is easy to show the detailed variations from zone to zone. But in general presentations, a difficult problem arises. On large scale maps, at least those over 1 to 16,000,000, one must make a choice between obscuring the whole area under a general heading "Mountains" or trying to bend one's isoplethes into the major

[6] Sweet clover has been used as a green manure crop to a very limited extent.

[7] "Integration of the Use of Irrigated and Non-irrigated Land in the Intermont West." Abstract. *Annals of the Association of American Geographers*, Vol. 44, No. 2 (June, 1954), p. 207.

wider valleys. As a resident and citizen of the region, as well as a geographer, I cannot help feeling pain when I see half the region (mountains and valleys together) mapped as bunch-grass steppe and the other half (valleys and mountains together) mapped as needle-leaved forest. It seems better to enclose the area in another symbol, "Mountains too detailed to show on this scale." Then if time and space permit, add an explanation that "Mountain Region #1" includes bunch-grass steppe, needle-leaved forest and alpine tundra formations in successive altitudinal zones.

In teaching, this seems even more important. If human ecology is the study of society as a whole within its environment, then, obviously we must recognize that all of the zones together form the environment for society in the Northern Rocky Mountains. All the land uses occur side by side. Lumberman, rancher, farmer and tourist court operator compete, not only in the state legislature, but also in the county commission and local Chamber of Commerce.

We have been correct in teaching that mountain landform increases the complexity of a region. We should go on to add that this is a systematic complexity—not a jumble. It is a succession of altitudinal zones—each repeated in its proper place. Then we can teach the different successions in the different mountain regions. We do it on a grand scale for Tropical Latin America as a whole (Tierra Caliente, Tierra Templada, Tierra Fria). Why not for our own mountains?

Interdependence Between Zones

Further, it is important to recognize the zonation, since individual economic enterprises in the mountain region depend upon more than one zone. Irrigated farmers use water which is stored in the snow banks and soil of the forest and alpine zones. Ranchers move their cattle and sheep to forest zones for summer grazing. Tourist court operators depend upon the mountain scenery for the traffic which they intercept in the valley floor locations. Larger saw mills choose valley floor locations on the railroad for processing the resources which grow in the upper zones. These interzonal relationships are repeated thruout the region.

Understanding the zonally arranged environment gives us an insight into the problems of the region, many of which stem from the close association of different environments and land uses.

ROAD PROBLEMS

Even tho populations in the irrigated valleys are relatively dense, 10 to 30 persons per square mile, the problem of providing services, especially schools and roads, power and telephone, to them is more reminiscent of sparsely populated areas because of the attenuated shape of the valleys. It is not uncommon for children to ride a full hour both morning and night in the school busses and the road problem on the relatively small tax base is a constant difficulty for the county commissioners. The State-Federal highway system likewise faces a large mileage for a small population.

Road problems are crucial also in the forested lands. County commissioners feel no responsibility for roads within the mountains. No one lives there and most of the land is federally owned. In general, they have not built roads into the forested mountains. The Forest Service, on the other hand, hampered by inadequate appropriations, has not been able to build roads, without which it is impossible to get rational timber utilization.[8] Partly as a result of these factors, timber in western Montana has been grossly under-utilized during the last three decades.[9] Increased demand since World War II has resulted in a prospect of more complete use, but the problem of achieving even utilization thruout the region or even thruout a given mountain range is difficult. Naturally, a logger with a short-run point of view will want to cut the higher quality, more accessible timber first, leaving the slow growing, lower quality, less accessible timber of the higher parts of the mountains till later years. In actual fact, he is cutting all his year-round logging chances and leaving a resource which can only be harvested during the three or four warmer months.

WATER PROBLEMS

Timber harvesting also affects water, frequently referred to as the most important resource which comes from the mountains. In many areas, stream flow is increased by timber cutting. The danger of greater seasonality of flow, erosion and silt pollution is greatly increased. The interrelationship of forests to valley floor in respect

[8] Nicholas Helburn, "The Case for National Forest Roads," *Journal of Land and Public Utility Economics*, Vol. 23, No. 4, p. 371.

[9] Up to about 1910, locally heavy use was made of forest land for mine timbers and even for fuel to be used smelting ore.

to water is only one of several water problems. The others generally can be laid to the impact of the doctrine of prior appropriation upon this particular landscape. Old water rights are naturally carefully guarded. New projects, therefore, tend to be added separately, not integrated into older irrigation projects. After several successive additions, the total accumulation of dams, canals and siphons is so complex and so uneven that it can only be classed as grossly inefficient. Nevertheless, the protection of old water rights prevents the necessary agreements for a redesign of the whole structure.

Furthermore, old water rights are maintained only as long as the water is used, resulting in the tendency to apply the water whether it is needed or not since it might be needed in the future. This excess irrigation does mild damage (leaching) to the cropland upon which it is applied. It is likely to do serious damage to land below, where surface evaporation leaves toxic concentrations of alkali salts. No other single agency is responsible for as much cropland damage in western Montana as the accumulation of alkali salts in areas of high water table.

In 1949 it was estimated by the Soil Conservation Service that there were 175,000 acres of wet lands in western Montana. Of these, perhaps half have been caused or aggravated by man's use and misuse of water in the area. Fully one-fourth of the total is affected by salinity. Again the total 175,000 acres of wet lands may seem insignificant since it represents less than 1 per cent of the total area of the region. But it is over 9 per cent of the cropland of the region and 19 per cent of the irrigated land.

Wildlife Problems

Another problem derived from the inter-fingering of different environments is that of wildlife. Western Montana suffers from an excess big game population. Other wildlife problems such as the interference by beaver with the normal operation of irrigation systems shrink into insignificance compared to the impact of huge numbers of deer and elk. Contributing factors include their protection from both natural predation and hunting. Predator control was instituted primarily to protect the ranchers. Deer and elk herds also benefitted. Hunting has been limited in Montana, as in much of the United States, to specific seasons in the fall of the year and

until recently to males only. Opening up of mature and over-mature stands of timber early in the century provided excellent habitat. These conditions resulted in rapidly increasing game population numbers. There is generally no problem during the summer period as both elk and mule deer characteristically migrate to the high country for the summer. In winter, however, they tend to congregate on certain slopes. Before the excess numbers are carried off by starvation and associated diseases, they do severe damage to the vegetation of these wintering areas. The inability of the State Fish and Game Commission to recognize the problem early in its development and to correct it by more intensive hunting of both sexes has caused serious damage to the vegetation and a decline in the total possible numbers of big game that can be supported in the next few decades.

COMPETITION FOR VALLEY LAND

In a headwaters region such as this, the possibility of increased usefulness of stream flow thru dam construction and reservoir storage is enormous. There is an abundance of excellent reservoir sites in which a relatively small investment in dam construction would bring a relatively large return in the form of storage capacity and hydro-electric potential. Many of these reservoir sites are directly competitive with the small total area of agricultural land. In the minds of the local population, any increment in water storage which is associated with a decrease in agricultural land is thot of as a loss to the local economy. Even those reservoirs which are built entirely within the forested areas are likely to be resented since they drown familiar recreational sites, especially trout streams, and make more difficult the harvesting of timber products from the forest. In some cases a reservoir would completely drown all of the flat land, leaving nothing but severely disected mountains upon which to build the cities and transportation systems of the area.[10] The handicap of increased slope and the increased distance of any transportation system which must follow the convoluted shorelines of these reservoirs is fully recognized by the local population. It is small wonder that they foresee the decline of their communities and resent the construction of the reservoir facilities.

[10] P. D. Hansen, *Forests, Dams, and People*. 1950. Mimeographed booklet. U. S. Dept. Agriculture, U. S. Forest Service, Missoula.

From a national point of view, the destruction of the economic base of a whole valley, most of a county, may be justified. From a local point of view, there can be no possible justification. It's like asking a man to commit suicide.

Summary

In summary, physiography, climate, vegetation and soils are combined in western Montana into a complex which can be described as successive altitudinal zones. Each zone, within limits, has its own characteristic land uses. Both the problems and the normal functioning of the local and regional economies can best be understood in terms of the altitudinal zonation of environment and land use.

A SUBARCTIC HIGHWAY TRAVERSE OF THE SCANDINAVIAN PENINSULA

Lawrence M. Sommers
Michigan State University

The most northerly direct coast to coast highway on which an east-west cross section of northern Scandinavia can be made extends from Mo i Rana, Norway, 15 miles south of the Arctic Circle, 306 miles southeastward to Umeå on the Gulf of Bothnia (Fig. 1). The narrow winding gravel road, completed in 1939, rises abruptly for 27 miles to the crest of the Kjölen Mountains near the Norway-Sweden boundary and then gradually declines to sea level in Sweden. This paper presents the contrasts observed on an automobile traverse along this route and gives indications of the growing significance of northern Scandinavia.

During and since World War II the northern portion of the Scandinavian Peninsula increased in world strategic and economic importance. This area, previously in an isolated corner of Europe, now is significant in international affairs. Norway's exposed position, especially the northern flank, was partially responsible for deserting neutrality and joining the collective security of NATO even tho neighboring Sweden still clings to armed neutrality. Economic changes from the dominantly fishing, subsistence farming and grazing, lumbering and mining economy are also evident. New industry is being established in the accessible Atlantic Ocean and

Baltic Sea ports. The basic iron and steel industry is now in operation just south of the Arctic Circle at Luleå, Sweden. Production of the same material began in April, 1955 at Mo i Rana, Norway at approximately the same latitude. Other industry also is being initiated along the coasts with the intervening areas remaining largely subsistence agriculture and grazing along with commercial lumbering and mining. These coast to coast changes will be discussed under the following headings: Mo i Rana, Mo i Rana to the interna-

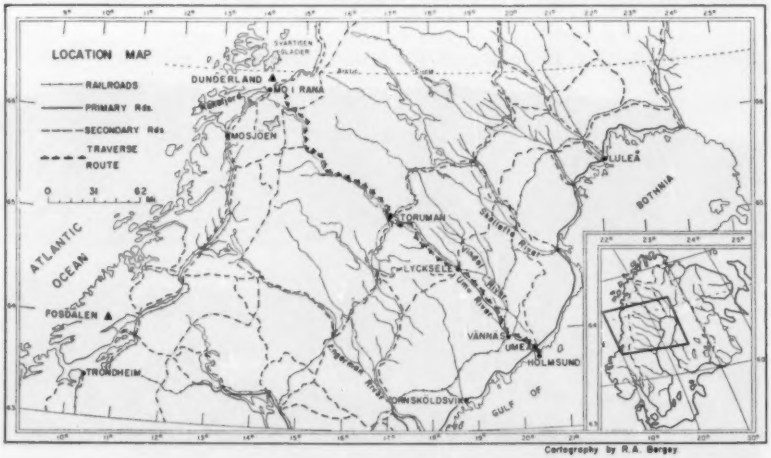

FIG. 1. Location Map.

tional boundary, the international boundary to Umeå and the Umeå area.

MO I RANA

Mo i Rana is changing rapidly from a small port serving the surrounding agriculture, forestry and mining districts to an industrial town looming high in the economy of Norway. The government subsidized iron and steel plant, A/S Norsk Jernverk, is the key to this growth. The present population numbers approximately 6,500 as compared to 4,211 in 1950 and 1,340 in 1930. The city will undoubtedly continue to expand.

The eventual goal of the large scale integrated iron and steel works is to supply most of Norway's needs of this basic material. The plant was begun in 1946 and total construction costs are ex-

pected to reach approximately 65 million dollars. The initial capacity will be 250,000 tons of rolled steel per year with the annual potential expected to increase to 500,000 tons in the future.[1] In 1952 Norway's imports of iron and steel products totaled 448,294 metric tons at a value of nearly 78 million dollars.[2] Thus the significance of this anticipated production in widening Norway's industrial base and in decreasing the present unfavorable balance of trade is obvious. The iron and steel industry will give impetus to employment. It is anticipated that 1,400 men will be employed by

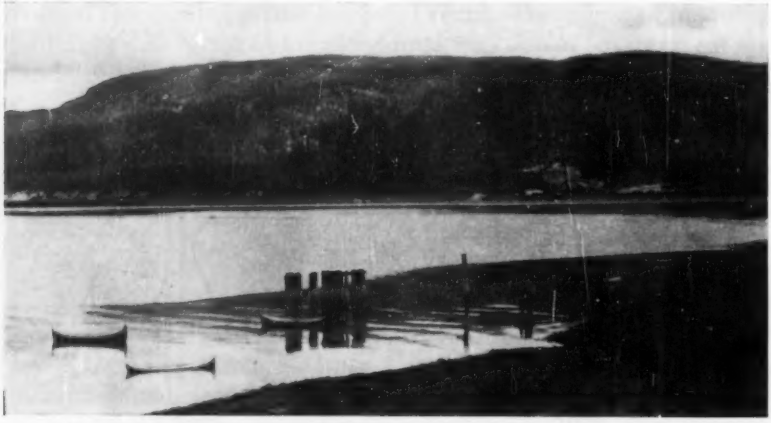

FIG. 2. The calm waters of Ranafjord and the opposite shore as seen from Mo i Rana. Note the abrupt rise in the background.

the steel works alone by the end of 1955 and others will be employed in service industries.

The site at Mo i Rana offers a combination of transportation, power and raw material advantages. It has an excellent protected deep water year around port on Ranafjord (Fig. 2). The rail line south to Trondheim connects with the network of southern Norway (Fig. 1). The railroad extends northward 88 miles to Saltdal and eventually will connect with Narvik and North Sweden. The principal north-south highway passes through the city and a smaller road to the east joins with the Swedish highway network (route taken by the

[1] Personal letter, Carl Mellingen, A/S Norsk Jernverk, January 24, 1955.

[2] *Norges Handel*, 1952, Del I, Statistisk Sentralbyra H. Aschehoug and Co., Oslo, 1954, p. 12.

traverse). Daily coastal steamship service is available by the route plying between Bergen and Kirkenes.

Available water power is another major advantage of Mo i Rana. A plant under construction on the Rössa River approximately 25 miles to the south will have an installed capacity of 120,000 kilowatts. A combined power capacity of 54,200 kilowatts is also available on the Rana and other rivers to the north. The melting of the Svartisen glacier assures more even summer flow of the latter rivers. Slow development of water power retarded opening of the plant.

Sufficient iron ore concentrates will be shipped in from Kirkenes

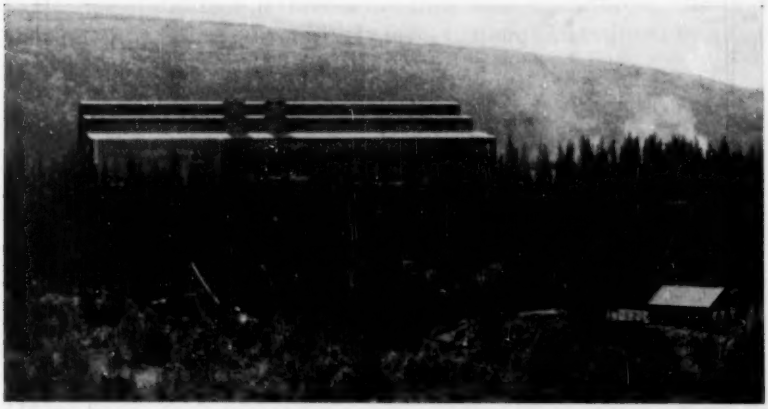

FIG. 3. Part of the main buildings housing the Mo i Rana iron and steel works.

in extreme northern Norway and Fosdalen north of Trondheim (Fig. 1). Eventually the nearby Dunderland deposit may be used where recent drillings have proven a minimum of 150 million tons of low grade ore.[3] Research is in progress to find more effective methods of processing this ore.

The Mo i Rana site also has disadvantages. Labor must be attracted from other areas in Norway. Coal and most alloys except for molybdenum will have to be imported from foreign countries. Construction of water power facilities is costly and an even yearly production is not assured. Production is remote from the major

[3] *News of Norway*, Norwegian Information Service, Washington, D.C., Vol. 10, No. 44 (December 10, 1953), p. 173.

markets for iron and steel in southeastern Norway but water, rail or highway connections are possible.

Features characteristic of a town in rapid growth are abundant in Mo i Rana. New buildings, buildings under construction, bar-

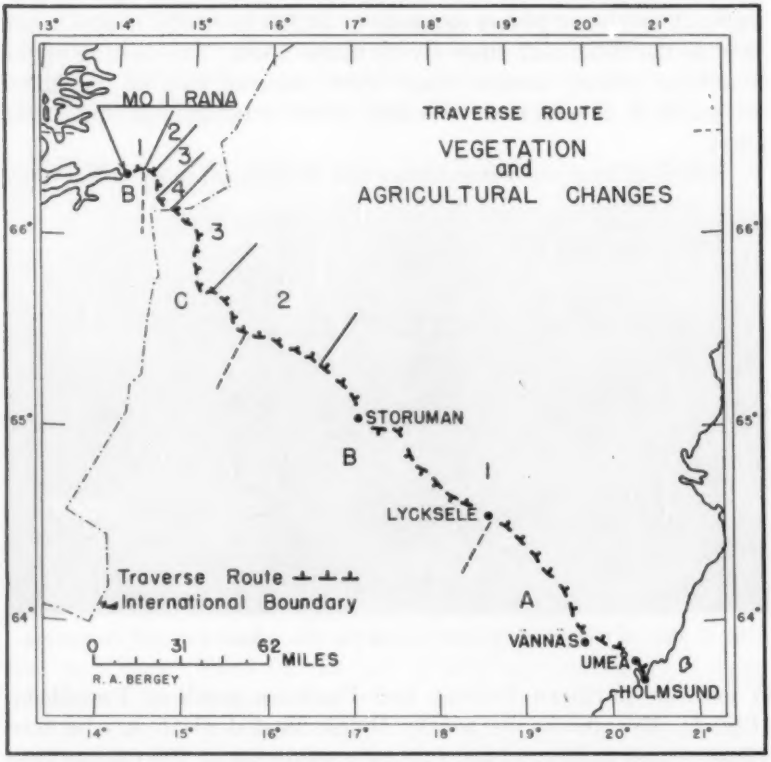

Fig. 4 .The numerals on the map represent the following vegetation types: 1) mixed coniferous and deciduous forests, 2) coniferous forests, 3) dominantly birch and highland moor, 4) highland moor. The letters represent the following agricultural types: A) dairy-pasture, hay, grain and potatoes, B) dairy-pasture, hay and potatoes, C) highland grazing and scattered subsistence farms.

racks type housing, dust, mud and torn up streets are but a few. It is a rambling town with no central core. Cranes, docks and harbor facilities have been built especially for the steel plant. Residential suburbs are under construction. The large, modern, sprawling iron and steel factory occupies a dominant position on a plateau-like

surface overlooking the fjord and town (Fig. 3). It appears incongruous in this barren Arctic Circle landscape.

MO I RANA TO INTERNATIONAL BOUNDARY

Eastward from Mo i Rana the narrow highway climbs past the sprawling iron and steel works. Then suburban and agriculture development continues for four miles. Following in quick succession are encountered narrow belts of mixed coniferous and deciduous (largely birch) and coniferous forests (Fig. 4). The coniferous trees are small and short due to the northerly latitude and of limited commercial value.

The birch zone is reached ten miles from Mo i Rana after a very rapid rise of 925 feet in three miles thru coniferous forest. Here the topography becomes a relatively level plateau interrupted by a few

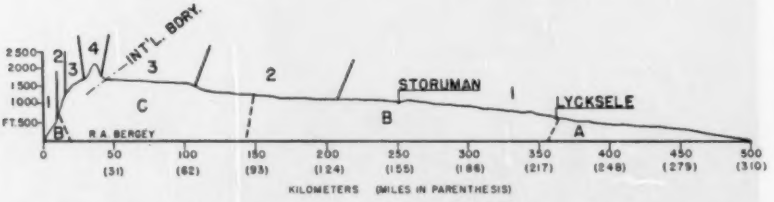

FIG. 5. Generalized profile along traverse route. Key to numerals and letters same as indicated in Fig. 4 caption. Horizontal scale is 1:2,000,000. Vertical scale is exaggerated 83.3 times.

higher peaks. Okstindene, the highest point near the highway to the south, is 6,310 feet above sea level. Klubben peak north of the road reaches 3,330 feet. The high point on the route itself is only four miles from the border at 2,145 feet (Fig. 5).

A narrow zone on either side of the heights of the Kjölen Mountains is above the tree line, found slightly below 2,000 feet at this high latitude. Here the vegetation is dominantly highland moor with a few scattered stunted deciduous trees such as birch. The higher peaks are quite barren and those reaching slightly over 4,000 feet possess permanent snow and ice. Both the birch and the highland moor areas are poorly drained with much swamp and numerous lakes. The largest lakes are generally on the eastern more gently sloping side of the Kjölen Mountains drainage divide.

Aside from the city of Mo i Rana, economic activity is limited in the Norwegian sector of the traverse. Agriculture, emphasizing

dairying, is found just outside the city and in favored valleys serving local markets. A few scattered subsistence mountain farms are found at higher elevations based almost entirely upon hay and summer pastures. The accessible coniferous and mixed forests are exploited on a limited scale. Pyrite is mined 11 miles east of Mo i Rana.

INTERNATIONAL BOUNDARY TO UMEÅ

After the abrupt rise in Norway, the highway begins the gradual decline in Sweden to the Gulf of Bothnia (Fig. 5). This distance

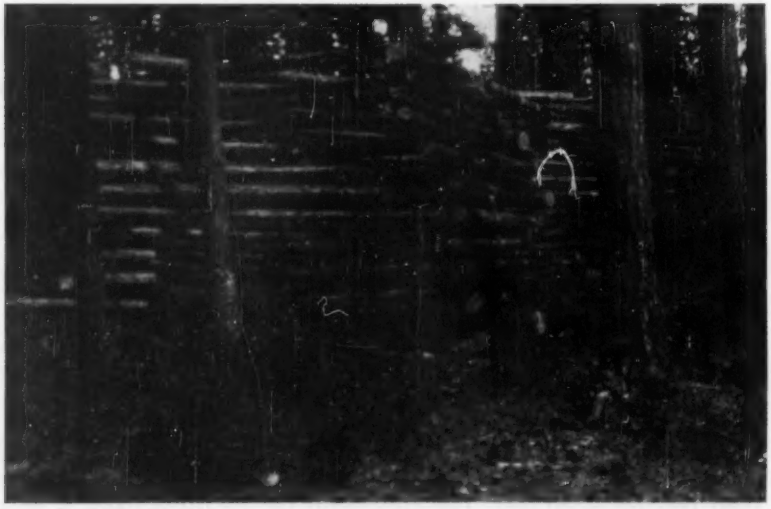

FIG. 6. Logs stacked along the highway awaiting truck transport just east of Lycksele.

accounts for about 90 per cent of the traverse. The highway in Sweden is wider and more utilized than in Norway. The road is closed to international traffic in winter because of heavy snow. The customs houses and mountain tourist facilities are the only settlements for some distance on either side of the border.

The Ume River Valley provides the route for the road in Sweden. Several large elongated lakes of glacial origin interrupt the river's steady gradient to the sea. In fact more than the first one half of the distance to the Baltic Sea is dominated by these lakes or by enlarged portions of the river. Rapids often occur as

the river leaves the lakes. The lakes cause the annual regime of the river to be relatively constant.

The same vegetation zonation is found in Sweden as in Norway but the belts are much wider (Fig. 4). The birch zone begins at the border and extends for 50 miles. Near the border the trees are very stunted and interspersed with highland moor vegetation. At lower elevations the trees become larger and the stands thicker until a mixture with stunted coniferous forest occurs at approximately 1,500 feet above sea level. This mixed zone extends for nearly 50 miles, stopping at an elevation of about 1,150 feet where a dominantly coniferous forest continues to the Baltic. Little evidence of

FIG. 7. Agriculture in the Ume River Valley just east of Storuman. The grazing cattle, hay being dried on racks, wooden farm buildings and forest on the slopes behind are typical.

timber cutting or logs floating on the river exists until Storuman is reached.

East of Storuman extensive commercial cutting of coniferous and some birch trees begins and continues to the coast. Piles of logs along the highway and the several trucks encountered on the road indicate the increasing importance of this means of transportation (Fig. 6). Nevertheless the Ume River, like most Swedish rivers, is responsible for carrying the majority of logs to coastal processing mills at Umeå and Holmsund.

Three types of agriculture occur in Sweden from the border to the coast. First are found approximately 95 miles of highland grazing and widely scattered farms where sufficient soil and flat land permit limited pasture and hay growth. The second type begins at

about 1,250 feet above sea level and extends to Lycksele, a distance of nearly 110 miles. The farmed area in the valley bottom increases considerably but is not continuous. There are large stretches of extremely rocky soil where huge boulders are jumbled together with coniferous trees finding difficulty to establish their roots. The farms emphasize cattle and dairying with hay, pasture and potatoes as the chief crops (Fig. 7). The hay must be cured on racks off the ground due to excessive moisture and low temperatures.

The third type of agriculture stretches from Lycksele, 750 feet above sea level, to the coast. The major crop change is the addition of cereal grains, principally barley and rye with a few fields of oats. The hay and grain are still dried off the ground as at higher elevations. Threshing of grain was being done in early September. The amount of farm land increases with the width of the river valley at lower elevations. Forests, however, comprise between 60 to 80 per cent of the total area and are always present on the higher slopes even in the farmed areas.

Lycksele, with a population of 3,520, is the largest settlement between the border and the coast. Altho it is the regional capital of southern Lappland, the primary functions are as a market town and highway transportation focal point. Storuman is a small railway terminus of the route from Umeå and is also a station on the interior north-south rail route (Fig. 1). Vännäs has limited lumber processing and is a local agricultural center. A few mountain resorts have been developed and scattered tourist activity also exists from Storuman to the coast.

The Umeå Area

Umeå, with a 1952 population of 17,325, is one of a series of Baltic cities at or near the mouth of large Swedish rivers dominantly supported by wood processing industries. Several smaller towns of which Holmsund is the most notable complete the Umeå industrial node. Holmsund, seven miles from Umeå, is the outport at the mouth of the wide Ume River estuary. Umeå is accessible for vessels with a draft of up to 11 feet while the excellent Holmsund harbor can handle ships up to 26 feet.[4]

Logs floated down both the Ume and Vindel rivers focus upon

[4] *The Scandinavian Yearbook for 1952,* Wm. Dawson and Sons, Ltd., London, 1953, p. 675.

Umeå and Holmsund. Lumber, pulp and paper and furniture dominate the industry of these cities and several smaller towns. The processing work is concentrated during the warm season when the river is free of ice but stockpiling provides for winter activity as well.

Umeå has a relatively modern appearance with wide streets and new buildings as a result of several fires, the last of which occurred in 1888. The swift flowing Ume River is a focal point of the town. Besides its industrial function Umeå serves the surrounding agricultural population and is the seat of the high court and provincial administration of northern Sweden. It is a transportation hub of coastal and interior highways and railways.

CONCLUSIONS

The immediate coastal sections of the traverse are far more important economically than the intervening areas. A traffic count indicates the importance of other sections of the route. From Mo i Rana to the border (27 miles) two cars, two trucks and five bicycles were encountered, an average of one vehicle per four miles. All except one truck was in the vicinity of the city. From the border to Storuman (133 miles) 18 cars, five trucks, two buses and 18 bicycles or one per three miles. From Storuman to Umeå (146 miles) the count was 25 cars, 20 trucks, six buses and 25 bicycles or one per two miles. The increase in trucks and buses shows the greater lumbering, agricultural and industrial development of the latter stretch.

Except for the coastal extremities, the area appears destined to continue as a subsistence agriculture and raw material region. The high latitude combined with high elevations in the interior result in a short growing season limiting agriculture. Increased water power utilization and development of the tourist industry provide restricted future possibilities. Greater use of the international highway hinges upon the continued economic development of northern Scandinavia. Despite limited commercial use it retains significance as a vital link between the peoples of two friendly countries.

SCHOLARS LEARN ABOUT SKIPPERS

A Description of the Adopt-A-Ship Plan and Its Merits

LORETTA MATTOCKS, GWENDOLYN PETTIGREW, JEAN SUTHERLAND
Clinton, Iowa

No teacher can take her pupils on actual excursions to "far away places with strange sounding names" but every teacher can bring remote areas into the classroom by touring the world vicariously. Such armchair journeys may be experienced thru various means such as reading books on travel, biographies, or novels with authentic historic and geographic backgrounds or by correspondence with persons living in or visiting in those areas. The "Adopt-A-Ship" plan will do the latter.

The general purpose of the plan is to develop understanding of, interest in, and support for the merchant marine among the nation's young people and, indirectly, thruout the community life of the country. Currently, schools in seventeen states are participating. To participate a teacher must contact the chairman of the Women's Organization for the American Merchant Marine, Incorporated.*

Possibly the best way to show how the project has enriched school work would be to tell of a few "highlights." The Clinton project was inaugurated over a decade ago in a sixth grade class of eleven and twelve year olds. To these pupils located in the Middle West, such terms as flying fish, "shooting the sun," Gulf Stream, Southern Cross, and even "lighthouse" give only vague mental images to many. Among the first souvenirs of this project is a flying fish which had landed on the deck of the ship. It reached the class stuffed, shellacked, and in perfect condition so all could see that the wings were really fins. The captain sent his picture to show how he held his instrument to shoot the sun. Accompanying the picture was a map, with explanatory data, which he had used on one of his trips. The location and names of lighthouses on this map interested the class to do some research on the history of lighthouses on the east coast of the United States. One letter received had been dropped overboard into the Gulf Stream, with the exact location and time recorded. The postal regulations concerning mail canis-

* 17 Battery Place, Suite 325, New York 4, New York.

ters found on the beach were explained. It is more fun to read latitude and longitude if one is locating the position of the Southern Cross as the captain reported seeing it; or in answering a "riddle" of a harbor's location.

Altho the school has an excellent visual education program, when slides come from the captain, showing some of the ports-of-call, native costumes, and market scenes, the attention is just a little more keen. After one such packet of views was borrowed by the local Camera Club, they offered the class a group of slides to send back as a gift. One set showing the ice moving out of the Mississippi River proved to be especially interesting to the employees of the line's company, since they lived on or near the rivers of Surinam. The captain reported that each time he had shown the views of ice and snow, he was requested to show them a second time.

Some of the most interesting gifts the class has received are a set of bow and arrows and a "Bush Negro's" hand-carved bench. These came from Surinam and were made by the descendants of escaped slaves.

Even twelve year old in-landers gained a better appreciation of the importance of the Merchant Marine after they had received letters from hospitalized sailors who told of some of their war-time experiences. During the war years the project had to take on another type of work. The suggestion of the Women's Organization for the American Merchant Marine was followed and the class sent boxes of gifts to Marine Hospitals. One letter, in response to a gift package, was from a Negro boy, a native of west Africa, who dictated his letter to the nurse. He wrote, "My people's clothes is robes." He had gone to sea when he was only eleven. An English sailor gave an interesting account of his apprentice training. One war-time letter contained pictures, taken by members of the ship's crew. These pictures were of an English vessel being torpedoed. The rescued crew, some of them Chinese, were shown climbing the rope ladders to the then neutral American ship.

Students who have been in sixth grade adoption groups, on entering the ninth grade project, have come with renewed enthusiasm to learn of a new ship and to make the acquaintance of a new captain. The ninth graders have been fortunate in corresponding over several years with the same captain. His teen-age daughter, who was in high school at the start of the project, added to the interest of the plan by writing to the classes about her own

school activities. Added to this were also letters from several crew members and, from time to time, passengers wrote interestingly of their experiences aboard. The captain's explanations of ocean currents, of the difficulty of navigation about Cape Hatteras off the North Carolina Coast, of the interpretation of latitude and longitude, and of navigation of the Panama Canal have made geography live in the classroom. His rhyme about the International Date Line cleared up, better than most textbook authors, a point puzzling to many people:

> When going to the west, Greenwich time is best. (add)
> When going to the east, Greenwich time is least. (subtract)

Others of the interesting topics of correspondence included descriptions of navigation in hurricanes, stories of rescues at sea as well as the burial ceremony at sea, stories by crew men telling of their relief aid to flood and other disaster victims at foreign ports of call, the captain's description of his contacts with interesting and famous people such as Dr. Bush of atomic energy fame. All of these have aided greatly in making the adoption of a ship a new and interesting experience.

The ninth grade project has centered around bulletin board displays of the varied materials received from the ship. The board itself, a beautiful gift from the captain, is 3½ feet by 6 feet, made of Honduras mahogany, backed with green felt, and embossed with the company's flag and the name of the ship. This board has given opportunity for committee work to arrange for display of the many valuable materials received and has led to interesting group discussions. Included in these displays were navigation charts from the pilot room, weather charts, supply lists, cargo lists, as well as crew lists with their varied nationalities. Valuable folders received included descriptions of banana culture since the ship's cargo is this fruit. She is engaged in coastwise trade between New York and Seattle, picking up the fruit at various Central American ports and discharging it at ports on either coast of the United States. Among the most interesting newspaper clippings received were those dealing with the Captain's convoying Thanksgiving turkeys to G Is under General Mark Clark in Italy in 1943. In the same voyage the captain delivered the first penicillin to the troops in North Africa and, in so doing, became separated from the convoy and was obliged to complete the voyage unescorted.

Previously, his ship was in the center of the convoy indicating the importance of his secret cargo of penicillin. Eleven years later the Captain personally met General Mark Clark in a United States port and was thanked personally by the General for his delivery of the turkeys.

Perhaps the most unique thing about the ninth grade Captain is that he is an artist in his own right, having completed more than one hundred oils, many of which have been exhibited at the Seamen's Art Exhibit held annually in New York City. His subject is always of the sea and the class was honored in receiving one of these paintings as a gift from the Captain.

The "Adopt-A-Ship" plan has recently been introduced in the Core Curriculum Department of the Junior High School. At the junior high level, much recognition is being given at the present to the core curriculum.

Its use is not an assurance of great gains in achievement. But it does have great possibilities. Its successful use is dependent upon the qualifications of the teachers and the availability of desirable materials. The "Adopt-A-Ship" plan has supplied much of this desirable and valuable material in the form of letters, maps, pictures, magazines, personal contacts, and vicarious experiences to aid in securing satisfactory results in this school's Core Curriculum Department. It makes available to the teacher a valuable and continuing teaching aid that can be applied to a number of subjects in such a way as to make children eager for opportunities to learn. Not only does it stimulate interest in history, geography, and science but it has resulted in a marked improvement in English, letter-writing, and penmanship. It imparts reality and depth to a number of classroom subjects, coordinating "theoretical" learning with practical living and develops knowledge of, and interest in, a wide variety of seagoing and shoreside industries and professions.

Its value in providing for individual differences is immeasurable. Surveys indicate that the gifted children are most often given extra reading assignments; that they live up to expectancy in reading but not in all areas. The "Adopt-A-Ship" project can provide for them opportunities in the fields of art, research, social problems, and self-expression. For the retarded, it offers stimulation and incentives. A retarded reader who cannot be motivated to read with enthusiasm his reading text has often, of his own accord,

picked up the "Fleet Flashes," a magazine sent to the class by the steamship company, to read an article about "his" ship or to interpret the map key to find the location of the ship.

The wealth of the experiences resulting from the plan can never be fully measured. The classes have felt the project is very worthwhile and undoubtedly memorable beyond the years when much of the factual materials of their textbooks will have been forgotten. Former students now in college or in employment, on returning to town, frequently inquire about the captain and the ship as they recall their past opportunity for armchair journeys around the world. The plan has inspired teachers and pupils to pass the word along to other teachers and pupils. Local newspapers have publicized the "Adopt-A-Ship" plan and have been generous in their praise. The experiences of teachers is that the project grows rather than diminishes in interest.

GEOGRAPHY AND FLOOD CONTROL

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In recent years it has been widely publicized that water problems in the United States have become increasingly complex and are more demanding of our attention. Articles in technical journals as well as popular magazine and newspaper accounts quite frequently discuss such problems as water shortages and lowering of ground water tables occurring in some places while there are disastrous floods in others. While many pertinent facts for the solution of these problems appear to be available and the public is somewhat aware of the problem, the national water program is still inadequate and there seems to be no particular prospect of the situation improving before it becomes worse. In fact, the continued population growth coupled with increased congestion in the river valleys and the encroachment upon marginal land gives every indication that water problems will become more acute.

One of the great water problems of our time is the occurrence of damaging floods. The reduction in flood losses and the retention of surplus waters at a minimum of expense is an immediate urgent need.

Because of the considerable amount of damage brought about

by floods, our present system of land utilization appears to be imperfect. For example, it may be suggested that perhaps too many industrial and residential areas are located on stream flood plains, which are always more or less subject to inundation at varying time intervals. In regard to this thought, there is one very apparent and fundamental fact that seems to have been neglected and should be more widely publicized. *Flooding is a perfectly natural process; it has always occurred in the past and shall continue to occur in the future.* Proof of this fact is immediately evidenced by the presence of flood plains, which, in reality, are beds of streams during their period of high water. There is no doubt that, under present economic conditions, it is advantageous for some flood plains to remain in use as they presently are; however, any tendency to avoid flood plains and to locate or to relocate on higher land should be definitely encouraged.

The great concern in the last few decades over the magnitude and frequency of occurrence of floods has brought about much study and debate in the attempt to choose the most satisfactory method of flood control. The evaluation and selection of the proper methods require a thoro background and understanding of the natural and cultural characteristics of the drainage basin subject to flooding. These factors are many, and their relationship is complex.

Because the geographer studies the interrelationship of these environmental phenomena, he is in a definite position to assist in the selection of the most beneficial methods of flood control. Altho many scientists such as foresters, engineers, hydrologists, meteorologists, and conservationists contribute to our knowledge of floods and flood-control methods, the qualified geographer can correlate and coordinate the efforts in various fields and present a balanced picture of all aspects concerning the causes, characteristics, results, and control of floods.

Thus, the purpose of this paper is to indicate the effects of various environmental features upon the chief methods of flood control; to show that these factors are complex and interrelated; and to illustrate that the geographer has a definite place in the field of flood control.

Fundamentals in the study of floods may be divided into two categories, physical and cultural. It is essential not only to understand a drainage basin's climatic, physiographic, edaphic, and biotic

features, but their relationship with various cultural phenomena as well. These include population distribution, agricultural and manufacturing features, and transportation and communication networks. Furthermore, a competent worker in the field of flood control would necessarily be familiar with various related aspects including the hydrologic cycle, streamflow, soil erosion, and water runoff, in addition to the several methods of combating floods. Major methods are channel improvement, proper land use, multiple-purpose reservoirs, retarding basins, levees, and retaining walls.

The following paragraphs will indicate some of the diverse and complex environmental aspects of the flood problem.

PHYSICAL ASPECTS

Of the numerous geographical aspects to consider in the application of flood-control methods, the physical factors are basic and require particular attention as they do in many geographic works.

Climatic Factors. Among the climatic aspects the importance of precipitation is obvious, and its qualities and characteristics must be studied. Runoff, streamflow, and soil erosion are directly affected by the quantity, intensity, duration, seasonal occurrence, variability, and form of precipitation.

Probably the chief cause of floods is excessive precipitation over a long period of time, but rapid melting of deep snow, ice jams, or favorable ground conditions may also contribute almost wholly or partially to the damaging flood conditions. For example, a cover of snow over unfrozen ground usually tends to absorb large amounts of water, but in warm spring weather especially, water concentrated in the form of slush melts quickly and flows off rapidly.

A climatic factor of equal importance to precipitation in the study of floods is temperature. Melting snow and ice, precipitation, evaporation, and transpiration are to a large degree governed by temperature conditions. Not only does cooling temperature, for example, cause ice to form in streams and in soils, but it also lowers the viscosity of water thereby resulting in a decrease of the effective soil infiltration capacity. A primary consideration in the specifications for concrete dams is the allowance for expansion and contraction, functions of temperature variations.

Wind, as a climatic factor of indirect importance, influences both precipitation and the rate of evaporation and transpiration.

Physiographic and Hydrologic Factors. Physiographic and hydrologic conditions are also basic in this study. Site selection and the building of structures are directly influenced by the shape, size, and topography of the drainage basin. These factors also affect streamflow—upon which much data has been collected during the past few decades. Furthermore, familiarization with stream bed characteristics and the areal geologic conditions is necessary. Geologic investigation is important in determining earthquake possibilities, in determining the suitability of particular foundations for structures, and in evaluating the sources of various construction materials.

Edaphic Factors. Soil characteristics are important in the study because the composition, texture, structure, water-holding capacity, and evaporation from soils have an effect upon runoff, erosion, and infiltration. Erosion of soil may be a primary consideration. Sedimentation may fill the reservoirs produced by dams or it may alter stream beds and the flood plain to a large degree. Sometimes this alteration is harmful, sometimes beneficial.

Benefits often result when rich sediment is deposited upon farming land. The flooding along the Nile River is the classic example of this aid to farmers. Harm usually results when coarse sediment is deposited.

At a particular site a thoro soil survey is generally required because it is necessary to use suitable soils if an earth dam is to be constructed.

Biotic Factors. Improper land use and unwise farming and forestry practices may accelerate erosion and intensify floods, but it seems significant that reforestation is not the sole panacea for the flood problem. Altho dense forest and grass cover retard erosion and water runoff and help retain the snow cover, floods have occurred over densely forested areas of the past. Nevertheless, crests of modern floods apparently are higher than formerly.

One of the greatest natural controls of floods is the beaver. This engineer with his many dams has retarded floods by reducing their crests. Undoubtedly we have learned many lessons from this creature and perhaps we could learn more. Burrowing animals such as ants and woodchucks generally increase the soil infiltration capacity and are beneficial; however, some rodents have increased flood damage because their burrows weakened levees or earthen dams.

In our construction of flood-control measures, fish and water-

fowl, even tho they do not affect the problem directly, should be considered in order that interference with their habitats may be kept to a minimum.

Even health aspects are of necessity considered by flood-control engineers. The incidence of encephalitis and malaria, both mosquito-borne diseases, for example, are important because of the possibility of breeding places developing in impounded water. Moreover, the disposal of sewage requires a continuous flow of water. Dams or retarding basins may upset the present water and sewage relationship and cause deleterious effects.

Geographic Location. The geographic location of the drainage basin and the direction of its main axis with respect to cyclonic storms, and with respect to latitude affect stream flow and corresponding flood conditions.

Thus, some major physical environmental factors have been indicated. If these be studied and applied properly along with the cultural aspects, a favorable flood-control program should be realized.

Cultural Aspects

Although the physical aspects are complex and interrelated in themselves, they must be further correlated with those factors that are governed to a large extent by man. In fact, flood control means the protection of cultural features from floods. It is of little concern to anyone when floods occur in uninhabited or unused land. The following statements briefly and quite generally indicate the diversity of detail to be considered and the scope of planning that is included in the study of flood control.

The location of farms, towns, industries, and transportation and communication networks restricts the construction of dams to those areas where a minimum of relocation of such features will take place. It is usually very costly to alter present distribution patterns; however, in the past it has been found necessary occasionally. A standard rule says in effect that the sum of all benefits derived from a flood-control measure must be substantially more than the costs of its construction, maintenance, and operation. Whether all benefits and costs have been considered in the past, however, is unknown.

Agricultural practices often influence the location of a flood-control structure. Much controversy arises when, for example, a big dam is proposed to be constructed on good farming land

thereby flooding hundreds of acres of rich, productive land in order to protect urban centers downstream. In this respect, retarding basins have a certain advantage because they do not ordinarily obstruct the rivers except during floods. The basins are thus usually in their normal condition and can be used for crop growing just as tho there were no dams. Floods in the Northeast generally occur in the late winter or early spring; hence, little interference in agriculture by retarding basins would be expected anyway.

Quite frequently reservoirs flood cemeteries and occasionally cover areas valuable as historical or archeological sources.

Sometimes wildlife and recreation areas are destroyed, but the use of multiple-purpose reservoirs may improve the recreation facilities. Reservoirs must often be considered in their relation to other purposes such as navigation, irrigation, or as a source of industrial water supply.

Other elements pertinent in the construction of dams include transportation facilities, accessibility of the site, and the availability of construction material and labor.

Levees are ordinarily valuable as protection for cities. It is sometimes necessary to essentially surround a city in flat terrain with levees. Construction of levees is complicated by the entrance to the river within the city limits of smaller streams and by the interception of railroads and highways. Consequently during floods a certain amount of temporary isolation results in unpleasant interference with business and other urban functions. Nevertheless, this is usually better than the damage and interruption of service that would result without flood protection.

Channel improvement is an inexpensive way to alleviate local flood conditions; but, on the other hand, the loosening of the sides and beds of a stream often leads to excessive washing, a disadvantage which results in the weakening of foundations of buildings or abutments for bridges thereby causing the structures to fail.

Of prime importance, however, is the economic consideration. As with many projects sponsored for the public welfare, the chief obstacle for their construction or maintenance is the cost involved. Much more study is needed to determine the least expensive and most beneficial flood-control program. In this regard more effort is needed to include all benefits and costs and to weight each fairly.

Moreover, one must not overlook social aspects. Relocation of

homes, old settled areas, and associated cemeteries and historical relics often results in a fundamental sociological problem. All are aware of an owner's sentimental interest in his old homestead. This intangible characteristic, which is typical of a great segment of our population, is very real and should not be neglected.

CONCLUSION

Thus these complex relationships of the various physical and cultural factors should be kept in mind in the selection and evaluation of flood-control methods. A national water program should go further, however, than only building dams and levees and improving channels and carrying out other present methods used in combating floods. It should place more emphasis on what is actually the most adequate and beneficial solution to the problem. That is the demonstration to the population of the risk involved in carrying on various activities on land subject to flooding.

Perhaps it will prove feasible to establish boundaries of possible flood limits in periods of 5, 10, 50, and 100 years in valley areas. Accordingly when a farmer or factory owner settles between the stream and one of these boundaries, he can know in advance the risk taken in settling where he does. Because the most productive land and much level land is located nearest the streams in some areas, it may well be worth the risk. But he should not, if he is flooded out, blame the government or the weather, and clamor for extravagant flood-control programs. It may be wiser to keep permanent structures off land likely to be flooded, and to use such land for agriculture wherever practicable.

The federal and state governments, while they definitely should not restrict people from using flood plains, should discourage them from utilizing such land for industries or other enterprises subject to large flood damage loss. In other words, the government should, by official publications and information dissemination procedures, encourage the utilization of flood plains for only those purposes which are harmed little, if any, by the occurrence of floods.

A chief purpose of geography is the determination of the manner in which man can best utilize his natural environment (best meaning most favorable to all concerned). Here is an excellent opportunity for geographers—to establish a sensible and satisfactory program of land utilization of flood plains and adjoining valley areas.

While dams, retarding basins, levees, and channel improvement are unquestionably of great value, it is believed that they should be fundamentally secondary and supplemental to the foregoing plan.

In summation, the study of floods and the application of flood-control methods require a thoro understanding of the numerous interrelated natural and cultural characteristics of the drainage basin in which the floods occur. Furthermore, familiarization is essential with the relationship of the local flood problem to the national water program as a whole as well as its accompanying or resultant effects upon the national economy. Consequently, flood control provides an outstanding example of an urgent present-day problem to be studied by geographic interpretation and solved by the application of geographic engineering procedures.

THE GLOBE AS A GEOGRAPHY TOOL

DOLYNE ROBERTSON
Centralia, Illinois

Teachers of primary grades are sometimes at a loss as to how geographic material may be presented to these children at their level of learning. Altho the geographical information which these children have is limited, it is always best to begin with the knowledge which the child has and use it as a basis for giving new experiences. The plan that follows may be suggestive as to how geographic material can be presented in the primary grades.

An actual lesson using the globe as a geography tool. Aim—To teach the children global directions and to prepare them for map reading. Procedure—

I started by asking if any of the children had ever had someone ask them the way to a certain building or place of business.

Some had been asked the way to a certain person's home. One little girl said a stranger in town had asked her to tell him the way to the post office. I then asked her to tell the class how she directed the stranger. She did so. This resulted in much discussion about how to give direction to strangers to help them find different places in our small town.

While talking of strangers visiting our town, I asked them how

many knew what strangers had arrived in Centralia by plane and parachute a few days ago. Of course, this was Santa Claus. Then the question, Where is Santa's home? Did you ever hear anyone say that Santa lives "up north"? Did you ever hear anyone say that birds go "down south" in winter? Which way is up? Which way is down? Can you point overhead or at your feet when giving directions? We need to know directions when telling where someone lives.

I showed them the globe and showed them that Santa Claus land was at the north pole and that anyone facing the north pole on any part of the globe would be facing north and that south would be to his back. Each child was to imagine himself standing on the globe facing the north pole. South would be back of him and the in between directions would be east and west. When facing north, east would be to his right and west would be to his left.

I asked if anyone had sent a Christmas package to a friend or relative in the armed service. A little boy had an uncle in Korea, so I located Sandoval on the globe and then we located Korea. Then we talked about whether Korea was north of Sandoval, south of Sandoval, east or west.

I showed them which way we would face in our room, in order to face toward the north pole. All of us turned our faces to the north, and then we located the other directions.

This concluded the lesson for the first day.

This lesson was followed by one where each child made a map of our own room, putting the directions on this map. They located such things as the teacher's desk, waste basket, children's desks, metal storage cupboard, library and chairs used by reading groups. This used another class period.

This was followed by a trip to our business district to locate the main streets and the places in our town which people would be most likely to ask us to help them locate.

Following this trip the class drew on a large piece of paper the places in our town which we located on our trip. We put the directions on this map, located north and south streets and east and west streets.

We located the bank, the post office, the lumber yard, the bakery, the two railroads and the depot, the Kroger store, the drug store, the barber shop, and two grocery stores. After our map was finished we located certain places, such as, which direction is the

Kroger store from the post office? If you are at the bank and wish to go to the drug store which direction will you go? The children enjoyed this and worked eagerly at it, because they could see a real need for it.

A GEOGRAPHIC EVALUATION OF PLAINWELL, MICHIGAN

ELMER B. HESS
University of Michigan

In Plainwell, a typical small Michigan community, there are four distinct districts; residential, residential development, manu-

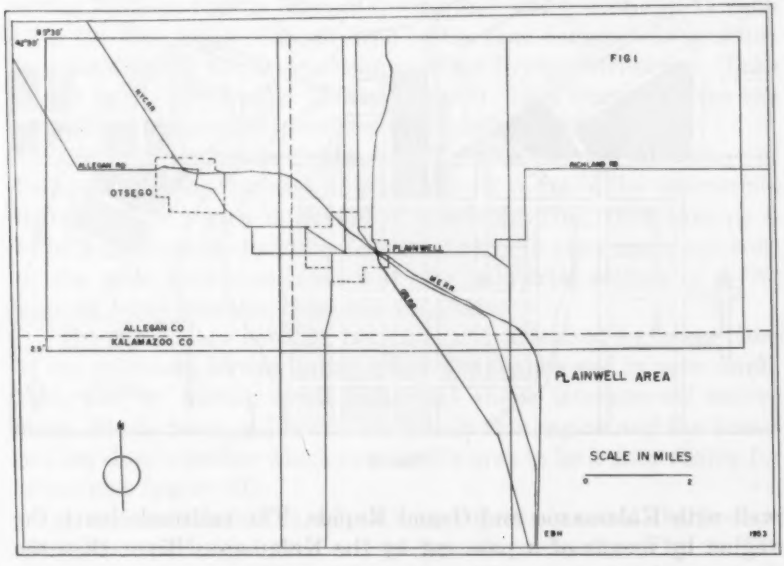

FIG. 1

facturing and commercial. The community has a population of approximately 2700 people.

THE SITE

Plainwell is favorably located at the junction of two main arteries of travel, namely M. 89 which runs in an east-west direc-

tion and connects Plainwell with Battle Creek to the east and Allegan to the west, and U.S. 131 which runs in a north-south direction and connects Plainwell with Kalamazoo to the south and Grand Rapids to the north (Fig. 1).

Besides these two main roads, Plainwell is serviced by two main railroads, the New York Central Railroad and the Grand Rapids and Indiana Railroad (Fig. 1). These two railroads connect Plain-

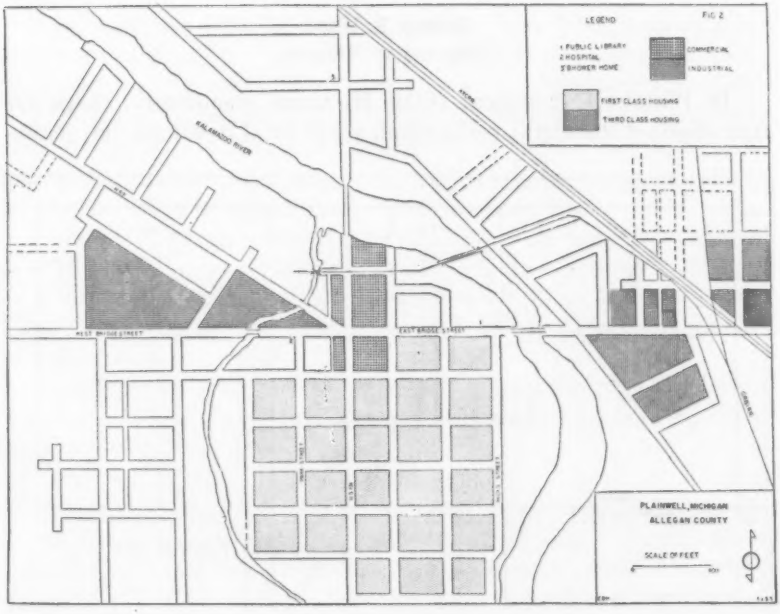

Fig. 2

well with Kalamazoo and Grand Rapids. The railroads leave the region by means of a pass cut by the Kalamazoo River thru the recessional moraines which surround the city.

The city itself is located in the southern part of Allegan County, Michigan. Plainwell is situated in the valley of the Kalamazoo River which flows in a northwesterly direction thru the city (Fig. 2). The surrounding countryside consists of an outwash plain of glacial origin which is farmed with moderate success. The soils of the outlying region are light sandy loams of fair fertility.

RESIDENTAL DISTRICT

In an area including most of the land between the mill race and the Kalamazoo River are first-class houses mixed with some second-class and a few third-class houses (Fig. 2). The section of first- and second-class houses is divided nearly in half by U.S. 131 and covers some 25 city blocks (Fig. 2). These first- and second-class houses are well kept and are mainly of medium size. As is typical of the middle class American homes, each yard has shade trees, shrubs, and bushes. Flower beds are also to be seen around the homes in this area. In the vicinity of Court Street and Gilkey Street is a subdivision of comparatively new homes which are built far apart, providing excellent conditions for the raising of families. On the corner of West Bridge Street and Park Street is the William Crispe Memorial Hospital which contains 25 beds (Fig. 2). This hospital is serviced by the four doctors who practice in Plainwell. At the intersection of East Bridge Street and Hicks Street is the city public library (Fig. 2). This library serves the immediate community plus the surrounding area.

The first- and second-class housing area has the advantage of being close to the business district, altho it is not in the commercial district. This region is devoid of manufacturing, thus causing it to be a much more desirable location to live in since there are none of the evils here associated with the industrial section of a city such as dump grounds, railroads and noise.

The third-class housing region is characterized by being close to the railroads, having homes which are shabby and in poor condition, and by having small industrial shops interspersed among them. Shade trees and lawns are few in this region and the homes are set close together which causes this area to be a poor region for home and family life.

A new residential area is situated to the west of the present first-class residential area and is expanding rapidly (Fig. 2). The new homes are spaced at wide intervals, but some of them are built next to older homes and "cracker box" shacks. After the final eliminations of these less desirable structures, this area will become an even more desirable residential area than is the present first-class housing area. This new region is not near any manufacturing districts and there are no main highways which would be dangerous to small children.

Commercial District

The commercial district of Plainwell is located along four blocks on U.S. 131. The southern limit of this district is marked by Chart Street, while the Kalamazoo River is the northern boundary of the main business center (Fig. 2). At the intersection of M. 89 and U.S. 131 are located the city bank, the city hall and a public drinking fountain. The commercial district contains variety stores, grocery stores, taverns, hardware and automobile service stores, professional services, and public utilities. This shopping district is basically a response to the local community, altho persons as far north as six miles and as far east as ten miles use Plainwell as their shopping center.

Altho the Kalamazoo River is the northern limit of the main commercial district, two commercial establishments of importance in the city are situated north of the river. On Second Avenue is the Brower Home for the Aged. This consists of a large frame house placed in the center of a large yard. The Del Vista Sanitarium is located north of the Kalamazoo River Bridge on U.S. 131. It consists of a large main hospital building plus numerous secondary buildings. The sanitarium is placed far back on the lot which is landscaped with many large deciduous trees and a large well-cared-for lawn. The buildings are connected with U.S. 131 by a private road.

This commercial district is situated where it is for a number of reasons. First, its central position in the city permits it to be reached easily from all sections of the city altho the better and newer sections of the town are not next to it. Secondly, this district centers on the intersection of U.S. 131 and M. 89 which are two important highways. Products to be sold in Plainwell are easily transported to this region by means of these two roads. The railroad is also close by providing an easy means of transportation (Fig. 2).

Manufacturing Districts

There are two manufacturing areas in Plainwell (Fig. 2). The area which covers the greatest acreage is located in the third-class housing district. Here are found small industries such as the Angle Steel Stool Company and the Plainwell Canning Factory (Fig. 2).

The second manufacturing district is located at the junction of the mill race and the Kalamazoo River (Fig. 2). Here is located the Michigan Paper Company mill which specializes in gloss and

semi-gloss paper. On M. 89 is located a disposal plant which is operated by the paper mill for the disposal of waste materials from the mill which would be otherwise dumped into the river.

The growth of this paper mill is the result of an excellent location regarding access to transportation facilities, an adequate water supply, and an abundant labor market. Due to the medium soil fertility, the farms do not provide an adequate income for the majority of the inhabitants, causing many of the farmers to work part time in the paper mill. The small manufacturing establishments merely reflect the demands of the local market and grade into commercial establishments such as automobile garages.

OUTLOOK FOR THE FUTURE

Plainwell is a self-sufficient community which has its own school system, churches, hospital, and cemetery. The new housing development on the west side of the city indicates that Plainwell is a growing city and that the residents have faith in its future.

New manufacturing establishments may locate in Plainwell. In this event, the commercial district of the city would need to expand and thus the present first class housing district would become the third class region and the present region of residential development would become the first class housing district.

LATITUDE TO A SLEEPING DUNCE

I faced south in the fifth grade
  While studying geography,
When teacher said that forward was north—
  It was south to me.
And when she said right was east
  I knew she must mean west!

Now when people give directions
  I go right back to my desk
  And stolidly face south—
Which, of course, is really north
Because when I face the map
  To the right is east.
  So I live east of Chicago
  Because LaGrange is to the right.

However, if you go left,
  Which is really west,
    Then Lake Michigan is west of Chicago—
Either that or I'm really living in Benton Harbor!

Moral: When teaching Geography—face your pupils north.

DOROTHY KRAMAN

CITATION

Distinguished Service Award to Joe Russell Whitaker

This year the recipient of the Distinguished Service Award is a person whose services to geography, and geography teaching in particular measure up to all of the standards listed. Among the criteria which the Distinguished Service Award Committee outlined as the basis for making the choice of the individual to receive this Award are: the training of teachers in the field of geography; the publication of books and articles of value to the geography profession and to geographic education in particular, contributions to geography as a profession such as geographic services to state, to country, and to the world; and active and constructive participation in the work of the National Council of Geography Teachers.

The recipient of the 1955 Distinguished Service Award stands at the top when measured by every one of the above basic standards.

For more than thirty years he has been training teachers in the field of geography; and he trains them well. He sets an encouraging example for students in his classes. He is careful in preparing every class lecture; for him teaching geography is consciously an art as well as a science. He is a zestful teacher for he enjoys his work and students catch his enthusiasm.

Those who visit his classroom come away with the following impressions. Here is a teacher who says what he has to say in simple language. He never resorts to browbeating and sarcasm; on the contrary he is sparing with criticism and always ready with deserving praise. None of his students fear him, but all admire him and feel his inspiration. In fact, the general student leaves his classes more hopeful, more interested in the world, and more sure of his place in it. The professional student feels sure that this teacher will lead him at once into fruitful lanes where there will be work especially for him.

Besides time spent in the classroom and in preparation for teaching the recipient of this Award has given much thought and effort to provide suitable material for teaching. This has led to his preparation of articles and textbooks both as an author and as an editor. Of particular interest to the National Council of Geography Teachers are the nearly fifty articles on methods of teaching and a well known book in that field. He has also written on geography in its larger sense, particularly in relation to border areas and to interdisciplinary fields such as conservation.

This individual has served geography in other capacities besides teaching and writing. He has been a member of the National Research Council since 1939; during the period from 1942 to 1944 he was consultant both to the War Department and to the State Department. In 1947, he acted as an adviser to the United States Military Government in Germany; in 1945 he was a member of the Educational Survey of South Carolina; and in 1946 performed the same function for the state of Idaho.

The last but not least of the Distinguished Service Award standards involves active and constructive participation in the work of the National Council of Geography Teachers. His services to the National Council are known to every member who has had anything to do with the workings of the organization. He has served on important committees, in various offices—he was president in 1938—and has always been one to whom individuals, committees, boards, and officers turn when needing constructive advice. He has been especially helpful as a bridge between the National Council of Geography Teachers and the Association of American Geographers.

In this brief analysis of the 1955 Award recipient's services to the geography profession many, many worthwhile contributions have been omitted. But enough has been

said to show that Dr. Joe Russell Whitaker is more than worthy of the Distinguished Service Award conferred by the National Council of Geography Teachers.

EARL B. SHAW, *Chairman of DSA Committee*
MAMIE L. ANDERZHON
KATHERYNE T. WHITTEMORE
HOWARD MARTIN
ALFRED H. MEYER
INA C. ROBERTSON, Secretary, *ex-officio*
M. MELVINA SVEC, President, *ex-officio*

R D CALKINS, 1873-1955

With the death of R D Calkins on September 27, 1955, geography lost one of its finest teachers. Born in Parma, Michigan, on April 20, 1873, Calkins' early life resembled that of thousands of aspiring youngsters of his time: he attended a country school and a small-town high school, and then taught in the public schools of his home community to earn money for further education. He acquired his interest in geography thru reading N. S. Shaler's "Nature and Man in America" as it appeared in the form of a series of articles in *Scribner's Magazine*. His career, like that of his fellow Michigander and almost precise contemporary, H. H. Barrows, took him by way of the then State Normal School in Ypsilanti to the University of Chicago, from which he received the degrees of B.S. in 1903 and M.S. in 1907. In intervals between discontinuous periods of study at Chicago he was instructor at Ypsilanti for two years, 1898-1900; and then went to the State Normal School (now Central Michigan College) at Mount Pleasant, where he served until his retirement in 1943.

Diffidence and an almost exclusive devotion to the tasks immediately at hand prevented Calkins from becoming as widely known as many less able colleagues. He was at his best in the lecture room of the admirably arranged and equipped quarters of his department, built in 1909 according to his own plans. Before a class his shyness and self-consciousness dropped away, as he bent his great physical and mental powers to the task of leading students thru chains of reasoning to the answers to questions that when first posed often appeared to the student beyond his ability to answer. Like many others, he was strongly influenced by R. D. Salisbury, of whom he once wrote: "He did not lecture. He taught. Under his skillful questioning geology developed in our minds as we thought our way thru the science." Calkins might have been describing his own methods. He, too, posed the "definite, pointed questions" and demanded "the equally definite answers" he recalled from Salisbury's classes.

The objective fact was as prominent in his teaching as was the logical inference. Under his guidance students learned to know the physical features of the country about Mount Pleasant. He had in his department, and used with consummate skill, an unsurpassed collection of teaching materials, from the "dingus" on his lecture table with which he demonstrated the path of the sun thru the sky in different latitudes to cabinets of minerals, rocks, and commercial products. Those of his students who went on to advanced work in the universities soon learned that the instruction Calkins had led them thru was more rigorous than much they encountered later.

Contemplating Calkins the teacher, it seems superfluous and even impertinent to speak of such matters as his presidency of the National Council of Geography Teachers in 1922 or his few publications. On writing for publication he said: "Why should I write about the little things I have observed? Let somebody else do that. My job is to improve the teaching of geography in the public schools of Michigan."

Peace to his ashes. We shall not look upon his like again.

JOHN LEIGHLY

University of California

THE NATIONAL COUNCIL AT WORK

Announcements of interest made at the November meetings in Indianapolis were: the Committee on Tests is to proceed with its plan of work; a series of publications on the teaching of geography skills and understandings, and on regional and topical understandings are planned; a four page leaflet on *Careers in Geography* for use in guidance classes at secondary levels is to be available in the spring of 1956; an *Index* for the JOURNAL OF GEOGRAPHY is to be developed.

All of these projects will supply long felt needs. Any member of the National Council interested in taking part in these or other projects, or in sending in ideas and suggestions, should write at once to the President. Individuals willing to work are needed. Deadlines need to be met to get these practical materials into circulation. Altho this note comes to you in January, there may still be places in one capacity or another for participants.

Members will be pleased to learn that Atlantic City, New Jersey, has been selected for the 1956 meetings on November 22-24. Plan now to attend. Bring the family along! Invite your colleagues even tho they may not be members of the National Council.

The Annual Report of the Secretary and the reports of the meetings will appear in a forthcoming issue of the JOURNAL. However, two items will be announced at this time. President-elect. Dr. Norman Carls of the University of Pittsburgh, assumed the leadership of the National Council on January 1, 1956. At the same time, Secretary-elect, Dr. John W. Morris of the University of Oklahoma at Norman, assumed the duties pertaining to that office. Both the retiring President, and the Secretary—Ina Cullom Robertson—wished to relinquish the various tasks prior to February 1, 1956, the official date for incoming officers to assume duties. Thus the new administration has more time to plan the work for the entire year.

M. MELVINA SVEC, *Past President*

GEOGRAPHICAL PUBLICATIONS

Sir Mortimer Wheeler. **Rome Beyond the Imperial Frontiers.** Philosophical Library, New York, 1955. xii and 192 pages with illustrations and index. $7.50.

Gordon Cooper. **Forbidden Lands.** Philosophical Library, New York, 1955. 165 pages with illustrations. $4.75.

Francois Balsan. **Capricorn Road.** Translated from the French by Pamela Search. Philosophical Library, New York, 1955. 252 pages with illustrations. $4.75.

Rome Beyond the Imperial Frontiers. This book deals with the influence of Rome on parts of Europe, North Africa, and sections of South Asia thru trade from about the last century B.C. to the 5th century A.D. It is based on archeological finds from graves and storage sites. Some mention is made of writings of Ptolemy and the Peutinger Table which aided the traders. The finds differed somewhat from place to place but there are many similarities. The artifacts include vases, jugs, broaches, statuettes, clothing, serving dishes of bronze and glass and coins of silver and gold obviously used in trade. Western culture also influenced the Buddhist statue. This book has little value for any geographer except one who is interested in an early historical study of the Old World.

Forbidden Lands. This publication consists of twelve chapters, one each about inaccessible areas, some occupied by primitive peoples. Lands discussed are: Interior Asia including the Takla Makan and Gobi Deserts; Southern Arabia; Interior Burma and Assam Hills; Formosa; New Guinea; Arnhem Land in Australia; Southwest Africa;

Libyan Desert of North Africa; Ungava Peninsula of Canada; Northern South America between the Amazon and Orinoco Rivers; Tierra del Fuego in Southern South America; and the Caucasus Mountain area.

Some places the writer visited, others he read about. For all he gives information on physical geography, the occupants, and the way they live. Exploration data is given for others. The material is written in a very readable style and should serve as useful supplementary material for college students of world geography and for public school teachers.

Capricorn Road. This book gives an account of the 1951 Panhard scientific expedition first to cross South Africa by truck from west to east on or near the Tropic of Capricorn. The group was headed by the author.

It is divided into four parts—travel from Johannesburg across brush and stony country to the Atlantic coast at Swakopmund and Walvis Bay, visits with Kalahari Bushmen witnessing their ceremonies, travel eastward among the swamps and contacts with natives and early native rock paintings, travel to the Indian Ocean at Masinga at the beginning of the rainy season, and return to Johannesburg by regular road.

Much in this book is of no particular value to the geographer, but one does receive a description of surface configuration, plant and animal life, native peoples, and their way of life.

It, like *Forbidden Lands,* has some value for the college student and teacher.

LYDA BELTHUIS

University of Minnesota

Wallace Stegner, ed. **This Is Dinosaur.** Alfred A. Knopf, Inc., New York, 1955. 100 pages with photographs. **$5.00.**

Controversy has raged, and is still raging, between those who would build dams to harness the Green and Yampa rivers and those who would maintain the present wilderness setting of the area. The authors of *This Is Dinosaur* obviously favor the continued maintenance of Dinosaur National Monument as a refuge from modern civilization. The book is not completely objective, since the authors are, by their own admission, prejudiced against the construction of dams in the area. When the reader understands this fact, however, he can gain much from the discussion of the geology, anthropology, history, ecology, and scenic beauty of this section of northwestern Colorado and northeastern Utah.

Probably the greatest single contribution of the book lies in the publication of more than forty pictures (many in color) which depict the Dinosaur landscape. One would have to be calloused indeed to favor a watery grave for the beauties of the Yampa and the Green. In short, capable authors combine to present an eloquent plea for the conquest of nature over man, but for the ultimate benefit of men.

ARTHUR H. DOERR

The University of Oklahoma

Glenn T. Trewartha. **An Introduction to Climate.** 3rd Ed. McGraw-Hill Book Co., New York, 1954. 402 pages. **$7.00.**

Teachers who have used the two previous editions of Doctor Trewartha's "Introduction to Weather and Climate" will welcome the 1954 edition under the shortened title. The new book is handsomely printed in a larger, two-column format, on a superior grade of paper.

As in the previous editions, the work is divided into two sections of nearly equal length: "Elements of Climate," and "Climatic Types and Their Distribution." Each section really forms a separate treatise, altho the second naturally would demand a

considerable knowledge of the basic principles developed in the first. "Elements of Climate" is an excellent treatment of meteorology and could well be used as an elementary text in that subject. In it, Doctor Trewartha has introduced a number of concepts and applications of weather principles that have not appeared in any similar book, to the writer's knowledge. For example, there are excellent discussions of the jet stream, of the degree-day principle in the maturing of certain truck crops, and of the role of low pressure areas in the precipitation within tropical and monsoon lands. Altho the treatment of meteorology is essentially non-mathematical, it is vigorous and up-to-date and could easily be supplemented by laboratory exercises in which the mathematical aspects of the subject are developed. Doctor Trewartha includes a large number of maps, graphs, diagrams and tables which contribute greatly to the clarity of his discussions. He also includes many useful references to recent and standard articles. This section of his book includes much excellent material in physical climatology.

The second section on "Climatic Types" is similar to that in previous editions, tho it has been rewritten and enlarged, with new illustrations. The chapter on climatic classification has been made more informative. Both circular and the customary bar-and-line graphs are employed for temperature and rainfall, while thermoisopleth diagrams are used to show temperature distribution within both daily and annual periods. Very interesting comments on zonal soils, vegetation types, and even physiographic processes follow the discussions of the climate types. Climate types are discussed from the standpoint of major world zones, tho there is adequate description of their differences from continent to continent. Doctor Trewartha employs his own long-tested classification of climatic types—a slight modification of the Koeppen scheme.

On the whole, the book forms an excellent text for the study of world climates on a systematic basis with emphasis on their causative factors and conditions. The writing style is somewhat heavy and tedious, but the diligent student is well repaid for his efforts.

WILLIAM E. POWERS

Northwestern University

Charles Robequain. **Malaya, Indonesia, Borneo, and the Philippines.** Longmans, Green and Co., New York, 1955. xi and 456 pages with illustrations, bibliography and index. $6.00.

This book, translated by E. D. Laborde, treats the physical conditions, economic, and cultural development, and political setting of the areas named. The author, Professor of Colonial Geography at the Sorbonne, has compiled a great quantity of information about these regions under a single cover. The organization is sound and the presentation is clear.

However, the book is far from ideal. The publication date (first printed in 1954) is misleading. Except for the final chapter, the only mention of post-war conditions consists of an occasional general statement or an explanatory footnote. Basically, the economic geography is historical geography ending at 1939, and most other social and cultural material is almost equally incomplete. Of the more than 250 bibliographical items, less than a half dozen were published within the last decade. Many place names are given an unfamiliar spelling. Sebu (Cebu), Holo (Jolo), and Kagayan (Cagayan) are illustrative. There are occasional descriptive statements that are no longer true, i. e., "In every Philippine pueblo there is a building . . . in which cock fights are held . . ." (p. 100). "Carts drawn by oxen or buffalo . . . still seen in the streets of Manila" (p. 288). The chapter on Christian missions gives reasonable detail about Catholic missions in the Philippines, but devotes only two sentences to Protestant missionaries (p. 396), and one of those statements is incorrect.

Despite these shortcomings, the student of insular Southeast Asia will find much of

interest. Section III, Colonial Expansion, and its effect on the Economic System, and Section IV, Colonial Achievement, provide good background for understanding some of the unsettled conditions that exist today.

ALDEN CUTSHALL

University of Illinois, Chicago

Alma Chestnut Moore. **The Friendly Forests.** The Viking Press, New York, 1954. 90 pages with illustrations. **$2.50.**

Mary and Conrad Buff. **Big Tree.** The Viking Press, New York, 1950. 80 pages with illustrations. **$3.00.**

Henry Billings. **All Down the Valley.** The Viking Press, New York, 1952. 208 pages with illustrations. **$3.50.**

Each of these three books emphasizes the need for conservation including the wise use of our natural resources. The books also show what happens when man upsets the balance in nature.

The Friendly Forests stresses the importance of trees to our civilization. The way in which trees grow and the contributions of forests to mankind are explained. It clearly points out the responsibilities man must assume to help conserve our forests for our physical and spiritual needs.

Big Tree is the story of a redwood that is now over thiry centuries of age. In describing the lifetime of this tree, living habits of animals, enemies of trees, and nature's way of keeping species alive are woven into the story.

The authors tend to personify trees giving emotions and thoughts to them. It would be better to have this tree grow as a tree rather than a thinking, feeling being.

All Down the Valley traces the Tennessee Valley history from the time the white man decided to move westward thru the operation of the Tennessee Valley Authority. This book shows the results of man's destruction of his natural resources and his need to carefully build them up again. Definite emphasis is placed upon the need for government sponsorship of rehabilitation projects.

All three books give careful, accurate information. *All Down the Valley* is highly technical in its explanations of the operations of the dams. This book and *The Friendly Forests* would be used primarily as reference books.

The books are very well illustrated. The pictures tell a story in themselves. The print is of comfortable reading size.

The books could be read independently by Junior and Senior High School Children. *All Down the Valley* would be best understood and enjoyed by college students or high school students interested in history and engineering. For an elementary school teacher, they would be excellent references. The elementary teacher could show the pictures to her classes and read parts of these books to them.

These books would make a good addition to any school library because of the clear, concise information which is presented in an interesting narrative manner.

RUTH SUGARMAN

State University of New York
College for Teachers at Buffalo

Jacques-Yves le Toumelin. **Kurun Around the World.** E. P. Dutton & Co., Inc., New York, 1955. 300 pages with illustrations. **$5.00.**

Kurun Around the World is the story of a young Breton's accomplishment of a dream to circumnavigate the globe in his own sailing vessel. After the war-time disappointment of losing his first boat, a second, the thirty-three feet long *Kurun*, was constructed. In

this he started westward from Le Croisic in September, 1949 with a friend, but the trip from Tahiti was made alone, a social state which the author prefers. The trip lasted almost three years, somewhat over one-third of it being actual sailing time.

There is much here of interest to the geographer as well as to the sailor. The author's descriptions of the diversity of sailing conditions which he encountered in the various wind and pressure zones are especially good, altho frequently explanations for the unusual are lacking. Since the book was not written for the technically minded person, this may not be considered a major criticism. The sailing techniques used to meet the many situations will be of special interest to those with sailing experience. The accounts of the varieties of sea life, from sharks and doradoes to lowly plankton types, are likewise of value.

The quality of writing improves when the author relates the events at his many ports of call. He gives accounts of the scenery and the local population which are fascinating. This is particularly true of the Galapagos Islands, the Cocos Islands and several others.

Unfortunately the writer's style lacks the polish and smoothness which would make the book more effective, and one might desire further development of some particular items. There is much here, however, to please the reader, especially if he is a devotee of the recent series of true adventures of the sea.

S. EARL BROWN

Indiana University

Margaret S. Anderson, **Splendour of Earth: An Anthology of Travel.** George Philip and Son, Ltd., London, 1954. xxvi and 404 pages with 4 maps and index. $3.50.

A collection of descriptive passages dealing with the physical features of the earth, this anthology must have required years of search thru travel and fictional literature. The selections, more than two hundred in all, and ranging in length from a short paragraph to four pages or more, are grouped under these heads: Climate, Winds, Oceans and Seas, Islands, Mountains and Plateaus, Rocks and Soil, Work of Rain and Rivers, Ice, and Deserts.

The compiler chose readings that she believed would stimulate the imagination, that deal with real physical features in identified places (all shown on the maps), and that are vividly written. The collection is designed to give a complete set of descriptions of all major physical features. Writings of well-known geographers and great travelers have been avoided. Somewhat disconcerting is the complete disregard for the date of each observation. This omission, no doubt a deliberate one, gives a sense of timelessness to the physical features described, but results in confusion so far as cultural items are concerned.

The volume is recommended to school and college teachers as a handy source of descriptive passages for classroom use, and it might well be used as a library reference, particularly for courses in which special attention is given to concepts in physical geography. It is possible, too, that passages from such great writers and "natural" geographers as Mark Twain, Kinglake, Stevenson and Belloc will whet the reader's appetite for more. If so, the appended list of works from which the selections were taken will prove to be one of the most valuable parts of the book.

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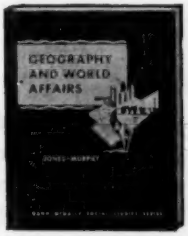

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12. Postage Stamps: A Useful Teaching Aid. By Raymond T. Hill.
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EDITORIAL NOTES AND NEWS

The following paragraphs are quoted from *Science News Letter* for January 1, 1955:

"All children could learn to read in a single school term if only our alphabet were perfect and our system of spelling phonetic, Miss Nellie M. Neal, Los Angeles educator, told the meeting of the American Association for the Advancement of Science in Berkeley, California.

This fact was shown, she said, when an ideal alphabet was constructed for the Tarascan Indians of Mexico. The whole tribe became completely literate in their own language in three months.

As it is, she said, English is bilingual. It is spoken one way and written quite another.

'We doo not rit az we spek,' Miss Neal writes in her report. 'The child iz konfuzed and duz not lik to be laft at hwen he pronounces wurdz fonetikalli. Ingglish iz lik French. Meni leterz ar just for seneri.'

The way should be paved for silent reading of bilingual English by periods of oral reading and drill on the pronunciation of new words, Miss Neal indicated.

This is not the modern trend. Many experts now insist that silent reading should precede oral reading and, in some schools, oral reading is no longer provided.

Words are introduced to children on 'look and do' charts. In one first grade class, when the words 'laugh out loud' were presented, all the children stretched out flat in their seats. When asked what they were told to do, they replied, 'lay out long.' The first word was more phonetically correct than laugh. Then the children had misread the third word to make it fit into the context.

When school children meet unfamiliar words in silent reading, errors do not creep in, Miss Neal declared; they are stampeding the schools.

When the way for silent reading is paved by removing word-blocks by eye training and oral reading, children will have time to read enough so the repetition of new words will incorporate them into the child's speaking and reading vocabularies. Thus many children will do three school terms of reading in one."

Twenty-six hundred of the more common geologic terms used by geologists, engineers, and professional men in allied fields, are clearly and concisely defined in the *Glossary of Selected Geologic Terms* by William Lee Stokes and D. J. Varnes, published as volume 16 of the Proceedings of the Colorado Scientific Society. Orders for this volume may be sent to Treasurer, Colorado Scientific Society, Box 688, Denver, Colorado. This glossary includes up-to-date definitions from specialists in teaching and commercial fields and from the authors' colleagues in the United States Geological Survey. Because the emphasis in selection of terms is slanted toward the overlapping field of engineering and geology, critics consider this publication as supplemental to, rather than competitive with, other important glossaries of geologic terms.

Why shouldn't geography be the subject matter core of the curriculum during grades 1-6, inclusive?

Is our curriculum adrift on a sea of pseudo experimental chaos without a rudder, navigation instruments and an experienced pilot?

GEOGRAPHICAL MATERIALS RECEIVED

1954 Oil and Gas Developments in Ohio. Report of Investigations No. 24, Petroleum and Natural Gas Series No. 7, Division of Geological Survey, Columbus, Ohio, 1955. vi and 58 pages with illustrations and tables.

This is one of a series of annual reports on statistics of the oil and gas industry of Ohio.

The United States and Germany, 1945-1955. Department of State Publication 5827, European and British Commonwealth Series 47, U. S. Government Printing Office, Washington, D.C. 56 pages with illustrations. 25 cents (paper cover).

Our foreign policy toward Germany over the last ten years.

Hellmut Berg. **Atmosphäre Und Wetter.** Humboldt-Verlag, Frankfurt, Germany, 1953. 312 pages with illustrations and index. DM 9,50.

Karl Krüger. **Das Reich der Gesteine.** Safari-Verlag, Berlin, 1954. 469 pages with illustrations, maps, bibliography and index. DM 19,80.

Hans Mortensen. **Ergebnisse und Problems moderner geographischer Forschung.** Walter Dorn Verlag, Bremen-Horn, Germany, 1954. 332 pages with illustrations and maps. DM 15,—.

André Parrot. **Discovering Buried Worlds.** Philosophical Library, New York, 1955. 128 pages with illustrations, bibliography and index. $3.75.

This book introduces a new series of Studies in Biblical Archaeology and provides a general survey of work done by archaeologists over the last hundred years.

Educators Guide to Free Slidefilms, Seventh Annual Edition, 1955.

A complete, up-to-date listing of free educational and informational slidefilms.

Sanford M. Dornbusch and Calvin F. Schmid. **A Primer of Social Statistics.** McGraw-Hill Book Co., Inc., New York. 1955. vii and 251 pages with illustrations, tables and index. $4.75.

This book helps the reader to develop the basic elementary skills in statistical analysis.

Dorothy Loder. **The Land and People of Spain.** J. B. Lippincott Co., Philadelphia, Pennsylvania, 1955. 117 pages with photographs and index. $2.75.

This book, one in the "Portrait of Nations Series" goes far into the past to tell of the history as well as the rich cultural life of Spain—its poets, painters, bullfighters, dancers and gypsies. Modern Spain is described and explained as the rich heir of this fabulous past. Sixteen photographs enhance the value of this introduction to one of the most colorful of our world neighbors.

Kenneth Ingram. **History of the Cold War.** Philosophical Library, New York, 1955. 239 pages with index. $5.00.

A study of the relations of the Soviet Union and other Communist states with the Western Democracies during the period between the end of the second world war (1945) and the death of Stalin (1953).

K. E. B. Jay. **Atomic Energy Research in Harwell.** Philosophical Library, New York, 1955. xii and 144 pages with illustrations and glossary. $4.75.

Description of the work done at Harwell—the British Atomic Energy Research Establishment between 1951 and 1954.

Kenneth Mason. **Abode of Snow.** E. P. Dutton & Co., Inc., New York, 1955. xi and 372 pages with illustrations, bibliography and index. $6.50.

A history of Himalayan exploration and mountaineering.

Joachim G. Leithauser. **Worlds Beyond the Horizon.** Alfred A. Knopf, Inc., New York, 1955. xvi and 412 pages with illustrations, bibliography and index. $6.75.

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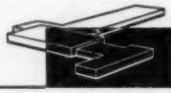

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